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TEACHER REACTION AND STUDENT RISK-TAKING BEHAVIOR

BY

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The undersigned hereby certify that they have read and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled, "Teacher Reaction and Student Risk-Taking Behavior" submitted by Donald W. Smith in partial fulfillment of the requirements for the degree of Master of Education.

ABSTRACT

The study involved an investigation of the relationship between teachers' reaction to students' responses and the behavior of students in risk-taking situations. It was hypothesized that there would be a difference in the risk-taking behavior of students from a class where the teacher reacts in a positive manner and the students from a class where the teacher reacts in a negative manner. When successful boys are faced with a non-academic task, those from the class of a positive teacher will take a greater number of moderate risks than will those from the class of a negative teacher. When the task is academic in nature, there will be no significant difference in the behavior of students from the classes of positive and negative teachers.

The sample was selected by rating teachers on a positive - negative continuum; this was carried out by three independent raters. The three teachers rated as most positive and the three teachers rated as least positive were each asked to choose the three most successful boys from their class.

An academic and a non-academic task was presented to each of those boys on an individual basis. The academic task was developed specifically for this study and the

non-academic task was based on a procedure developed by DeCharm and Dave (1965).

The results support the hypothesis as on a non-academic task, the moderate risk-taking score of the boys with the positive teacher reaction was higher than the moderate risk-taking score of the boys with the less positive teacher reaction. As was predicted, when the task was academic in nature, the moderate risk-taking score of the boys with the positive teacher reaction was not higher than the moderate risk-taking score of the boys with the less positive teacher reaction.

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CHAPTER I

INTRODUCTION

TWO CLASSROOM SITUATIONS

Mrs. Jones is introducing her Grade III class to a social studies unit on Japan. She has collected a variety of items of clothing, utensils and food as well as a number of books and pictures of the country. She is quite enthusiastic about the session as she has visited Japan and feels that the students will be interested in learning about the country.

As the students enter the room, they show considerable interest in the objects on display. Mrs. Jones cautions them, "Now, class, sit in your seats. Don't touch any of the displays until I have introduced them; we will all look at them together. Terry, leave those books alone!"

The room becomes very quiet; the students go to their seats and Terry kicks a classmate's chair as he passes.

"Today we will talk about Japan," begins Mrs. Jones. "I have collected a number of things which I hope you will find interesting; however, some of them are very valuable, so if anyone breaks anything, they should be prepared to replace it."

"Now, probably the first thing we should talk about

is the size of this country. Angie, how large is Japan?"

"It's about as big as Canada," replies Angie.

"Pardon?" asks Mrs. Jones. There is surprise and perhaps a hint of sarcasm in her voice.

"It's larger than Canada," comes the second response.

"Come on, now, Angie; you're getting worse instead of better. Can anyone else help us?"

"Smaller," answers the class in unison.

"Well, I've just told you that," replies their teacher. "Can't anyone come up with anything more specific?"

There is no response.

"How much smaller?"

Still no answer.

"Well, Jean, what do you think?"

Jean hesitates for a moment and then offers, "About half as big...or so."

"Well, what do the rest of you think of that?" There is no answer to the teacher's question.

"How many of you agree with Jean?" There is still no answer.

"Well, does that mean that you all disagree with her? How many disagree?"

There is still no response from the class and the students look at their books as they feel the teacher's eyes move in their direction. At this point, Mrs. Jones is

becoming very impatient with her class. She gives them a lecture on classroom participation and, before she can continue her lesson, the bell rings. Heaving a sigh of relief that it is finally three-thirty, she goes into the next room to tell her friend about her ungrateful class who, after all the preparation she has done, were not even interested enough to try to answer her questions.

Across the hall, Mrs. Alan is preparing her classroom for the next day. She, too, has just had an introductory lesson on Japan. She and Mrs. Jones worked together to collect materials for this unit. After first looking over the displays, this class also had a discussion on the size of the country. They had been talking about the population of Japan and one of the students commented that, with so many people, Japan must be much larger than Canada.

"It certainly might appear that way," replied Mrs. Alan. "Perhaps we should look at this a little more closely. Does anyone here know how big Japan is?"

Andrew answered. "My Dad said that it isn't as big as Canada."

"That's right. With all those people there, you might think it is larger, but it isn't." I wonder if anyone can tell us how much smaller than Canada Japan is?"

Another student offered. "Half as large?"

"You're getting closer!"

"As big as Alberta," suggested another student.

"That's even closer."

"Half as big as Alberta?"

"Right! Japan is only half as big as Alberta and has ten times as many people."

"Wow! it must be crowded!" was the reaction from David.

"That's right," answered Mrs. Alan. "Did anyone notice the pictures at the back of the room showing the crowds in the streets of Tokyo?"

The bell rang and the students gradually left for home. They will continue to learn about Japan next day.

For the purpose of illustration, the two situations are obviously different. The first group of students was very cautious about answering questions, particularly when they were uncertain about the correct answer, whereas the second group readily supplied answers even in situations where their information was limited. The students in the first group appeared to be concerned with avoiding failure; they would rather give no answer than be incorrect. Failure, on the other hand, seemed to be less important to the students in the second group; they continued to offer answers until one that was completely satisfactory had been presented. Two obviously different reactions to risk

taking are apparent here. The first group does not appear to want to take risks; when they are forced into such a situation, they react with very cautious responses. The students in the second group however, react much more confidently and quickly in risk situations.

Although a difference between the two classes is apparent it may not be the result entirely of some students being indifferent or ungrateful as Mrs. Jones suggests. Obvious as the difference is between the reaction of the two groups of students, it is no more obvious than the difference in the teachers' methods of handling the situation.

In the first case, the teacher tends to restrict the activities of her students, to reject incorrect answers, and even belittle those which are correct. In contrast, the second situation presents a teacher who accepts student ideas and deals with them in a positive manner even when they are incorrect. Can it be that this difference in teacher behavior influences students' attitudes to new situations where risk is involved?

At any rate, the importance of appropriate risk taking behavior has been emphasized by Bruner and Tajfel (1961) who report research which indicate that individuals differ in their reaction to risk taking situations. As the excerpts from the classes of Mrs. Jones and Mrs. Alan indicate, every student engaged in learning is constantly

called upon to take risks. He is faced not only with situations in the classroom where his success will depend upon his ability to take appropriate risks, but also situations outside the classroom where suitable social behavior depends upon this ability. Interaction with his peers as well as with adults confronts him with situations where his risk-taking behavior is called into play. Whether it be asking a girl for a dance or a date, or asking his parents for the family car, the student's willingness to incur appropriate risks may greatly influence his success.

RISK-TAKING MODEL

Just what is an appropriate risk? Atkinson (1957) presents a model which identifies such risk-taking behavior and goes on to point out some of the attitudes of a person who exhibits such behavior.

Atkinson suggests that moderate risk-taking behavior is observed in persons who are more highly motivated by hope of success than by hope of avoiding failure. He feels that persons more highly motivated by fear of failure will take extreme risks. They will tend to choose alternatives which are very certain and thus assure themselves of success, or alternatives which are extremely difficult in which case failure is less a reflection on their ability than it is on

the difficulty of the task. In the former case, he sees a progressively increasing willingness to take risks as the probability of success passes from 0.00 to 0.50 and a gradual decrease in willingness as the probability passes from 0.50 to 1.00. He will expect the reverse process in the case of those more highly motivated by fear of failure than hope of success.

The earlier studies related to this area were carried out on a college population; however, Hancock and Teevan (1964) questioned the validity of using only such a group, as they felt that it would tend to be more success orientated than the general population. They worked with high school students and found fear of failure subjects showed significantly more irrational behavior than did those high in hope of success. DeCharm and Dave (1965) carried out work at the elementary school level. Their findings support the position of McLelland (1953) which states that the attitude towards achievement is developed between the ages of five and nine. Thus, the effect on risk taking behavior should be apparent at this early age and, as McLelland suggests, is also in a purer state, because it has not been affected by a knowledge of what the proper risks are.

In general, there appears to be strong support for the aspect of the Atkinson model which predicts that persons

who are more highly motivated by fear of failure than hope of success will react to risk-taking situations in ways which could be considered as erratic or atypical. The support for his prediction of the reaction of those more highly motivated by hope of success than fear of failure is not as strong; however, much research would indicate that such people would react to risk-taking situations by taking moderate, reasonable risks.

GENERAL TEACHER INFLUENCE

From the foregoing it would appear that if students are to exhibit profitable risk-taking behavior, it is important that they be more concerned with achieving success than avoiding failure. There are many factors which might influence this attitude; in fact, teachers may have significant influences on the students' attitudes towards problem solving situations. Purkey (1970) states that "the sensitive teacher points out areas of accomplishment, rather than focusing on mistakes. Continuing awareness of failure results in lowered expectations, not learning." (p. 56) Such an approach should develop within the student a greater concern with areas of success than with areas of failure.

Purkey interprets this influence of the teacher in terms of the self-concept; awareness of areas of success develop within the student a positive attitude towards

himself and his chances of success in problem solving situations. Atkinson would see him as a person more highly motivated to achieve success than to avoid failure. Not only is there research suggesting a relationship between a positive attitude towards oneself and academic achievement, but there is also some indication of a relationship between the self concept and social learning (Bledsoe, 1967; Williams, 1968; Morse, 1964; Barrett, 1957). Such a relationship suggests that the teacher, by modifying her approach to classroom management, could be instrumental in a change of the student's attitude towards himself and his chances of success both academically and socially. In Atkinson's terminology, she can influence his attitude to be either more concerned with success or with failure.

SPECIFIC TEACHER INFLUENCE

The relationship between a student's attitude toward his ability, and his achievement both academically and socially has been discussed. In conjunction with this, the possibility of the teacher having an influence on the student's attitude towards his ability was considered. Varieties of scales have been developed to categorize specific teacher behaviors and studies have been carried out to point out the relationship between those behaviors and student performance (Gage, 1965; Cogan, 1958;

Flanders, 1965; Ballack, Kleibard, Hyman and Smith, 1966)

Some of these scales speak of inclusive vs. preclusive behavior while others consider accepting - rejecting behavior. Flanders talks of the direct - indirect approach to classroom management. Common to most scales are a variety of behaviors and attitudes, and high among those is warmth, which Gage (1965) interprets as the "tendency of the teacher to be approving, provide emotional support, express a sympathetic attitude and accept the feelings of the pupils" (p. 88). Cogan (1958) considers integrative, affiliative, nurturant teacher behavior to be correlated with the amount of self-initiated work carried out by students. Flanders (1965) sees as being important statements which increase the student's freedom and encourage participation and initiative behavior. This approach involves asking questions, accepting and clarifying the student's ideas and feelings, and praising and encouraging the student's responses. A variety of other such scales have been developed; however, that of Ballack, et al. (1966) incorporates the spirit of most of them when teacher reaction is rated on a continuum ranging from positive through admitting, repeating, qualifying, not admitting to negative. Steines (1958) developed a similar scale on which all teacher statements were rated on a positive - negative continuum. On this type of scale, comments which would be

rated on other scales as inclusive, indirect, or high in warmth would be rated as positive, whereas statements which were preclusive, direct, or low in warmth would approach the other end of the continuum.

A number of studies have indicated that the positive, facilitative teacher will have students who will be more successful academically and more independent in most activities that they undertake (Canavan, 1969; Gage, 1965; Read, 1961; Ladd, 1972; Ryan, 1961). It might be expected that a student in such an atmosphere would tend to be more concerned with achieving success than avoiding failure as the teacher tends to reinforce behaviors which approach success and ignore behaviors which approach failure. The teacher, also, is providing a model of a person who is more concerned with achieving success than with avoiding failure.

If the Atkinson model is applied to this situation, it seems likely that teachers with a positive, facilitative approach to classroom management will tend to have students who take moderate risks where they have a reasonable chance of success and avoid either extremely high or extremely low risks.

Generalization as presented by Bandura and Walters (1963) is the process of relating a new situation to one which the individual has experienced in the past. Because

of the similarity between the two situations, he will tend to react in the new situations in much the same manner as he did in the previous similar situation. The process of generalization may have a positive effect in the class of the positive, facilitative teacher. By the very nature of her approach, she will be encouraging her students to attempt to solve new problems and to try new approaches. Besides developing independence within the students, this method will bring them into contact with a greater variety of experiences than the class where the teacher uses a more negative, restrictive approach. Thus, they should have a greater wealth of experiences to draw upon in handling new situations and, the principle of generalization being considered, should be able to handle such new situations more successfully.

The Atkinson model suggests that students who are more concerned with achieving success than avoiding failure will take moderate risks. If such students are found in the class of a teacher who reacts in a positive manner, this behavior should generalize to new situations.

CHAPTER II

CONCEPTUAL FRAMEWORK, DEFINITIONS AND HYPOTHESIS

CONCEPTUAL FRAMEWORK

The teacher's conduct of classroom activities will have an influence on the behavior of her students in risk taking situations. In terms of the model presented by Bandura and Walters (1963), this influence will be felt in two ways: through the reinforcement that the teacher gives to the students and through the manner in which they model their behavior on that of the teacher.

There is a difference between the risk-taking performance of students in a class where the teacher conducts activities in a positive manner and the performance of students in a class where the teacher is less positive (Canavan, 1969). The student with a teacher whose reaction to his responses is primarily positive will tend to be more concerned with achieving success than avoiding failure. This attitude will be evident in his reaction to risk taking situations where he will tend to take risks which are in the moderate range of probability of success (Atkinson, 1957).

On the other hand, a student from a class where the teacher's reaction to student responses tends to be nega-

tive will be more concerned with avoiding failure than achieving success. This attitude will be evident when he approaches risk taking situations: he will tend to choose either extremely low-risk situations where he will have little chance of failure or high-risk situations where failure will be less a reflection on his ability than on the difficulty of the task (Atkinson, 1957). The relationship between teacher reaction and student risk taking appears to be linear in nature; thus, whereas the student in a class where the teacher reaction is positive will take moderate risks, the student in the class where the teacher tends to be less positive will take fewer moderate risks.

DEFINITIONS

For the purpose of this study, a number of terms have been defined operationally.

1. Positive Teacher - is a teacher whose reaction to student responses tends to be at the positive end of the rating scale used in this study. They will tend to use such comments as "Yes", "Right", "O.K.", and "Uh-huh". (Appendix A)

2. Negative Teacher - is a teacher whose reaction to student responses tends to be at the negative end of the rating scale used in this study. She will tend to use

such comments as "Wrong", "No", "However", and "Nevertheless". (Appendix A)

3. Less Positive Teacher - is a teacher whose reaction to student responses is less positive than the teacher labelled as "positive". She will use fewer positive reactions than this teacher ws well as more negative and neutral statements. Neutral responses include sucn reactions as ignoring and interrupting behavior.

4. Successful Boys - are the boys who, in their teacher's estimation, are gaining most from the experience of being in her class.

5. Academic Task - is a series of mathematics problems of varying degrees of difficulty which are used to label the student's risk-taking behavior on an academic task.

6. Non-academic Task - is a game which consists of throwing a volley ball into a box from increasing distances. The student's reaction to this situation is used as a measure of his risk taking-behavior on a non-academic task.

7. Moderate Risks - are those which range around 0.5 probability of success (e.g., from 0.3 to 0.7) on the academic and non-academic tasks used in this study.

8. Extreme Risks - are those where the probability of success on the academic and non-academic tasks is either higher or lower than that included in the moderate

range.

HYPOTHESIS

Successful boys from a class where the teacher tends to react in a positive manner to student responses (Group A) will take more moderate risks in new situations than will successful boys from a class where the teacher tends to react to student responses in a less positive manner (Group B).

(a) There will be no significant difference between Group A and Group B scores in situations where the new task is somewhat similar to the original learning task (i.e., an academic task). However, a trend may be apparent in the direction of higher scores for Group A.

(b) Group A scores will be significantly higher than Group B scores in situations which are basically different from the original learning task (i.e., a non-academic task).

CHAPTER III

REVIEW OF THE LITERATURE

McClelland (1955, 1961) reports that one of the major factors involved in risk taking is motivation. Atkinson (1957) presents a model of motivation which sees the desire to either achieve success or avoid failure as an integral aspect of a risk taking-situation. This model has been applied to a number of age levels (Litwin, 1966; Hancock and Teevan, 1964; Canavan, 1969) and to groups with differing backgrounds (Flynn, 1971). Anderson (Flanders, 1965) and Canavan (1969) both emphasized the importance of teacher influence on attitudes affecting risk taking. Attempts have been made to categorize specific teacher behaviors and their influence on the student's attitudes (Gage, 1965; Shrago, 1970, Ryan, 1961, Flanders, 1965, Bellack, Khebard, Hyman and Smith, 1966).

BACKGROUND: ACHIEVEMENT MOTIVATION

The concept of motivation has been a central theme in attempts to understand human behavior for over a century. The earlier literature takes a common sense approach which sees behavior as appetitive and aversive and as being controlled by an individual's conscious wants. It was this awareness and control of his behavior which earlier writers believed separated man from the animals who were

controlled, primarily, by instinct. In terms of this understanding of behavior, motivation was seen as a very straightforward concept. However, the application of Darwin's theory of evolution changed this position by emphasizing the importance of instinct and individual differences in determining human actions. Thus, it was pointed out that a variety of factors must be considered in attempting to understand why an individual behaves as he does.

Atkinson (1957) developes a model which sees motivation as a function of three variables: motive, expectancy and incentive. Motive is interpreted as a disposition to strive for a certain kind of satisfaction; expectancy is the anticipation that if a certain act is carried out, particular consequences will follow; and incentive is the relative attractiveness or unattractiveness of the consequences of a particular act. Those three factors interact to determine how an individual will react in any situation. Atkinson (1964) extends his model to include the tendency to strive for an achievement-related activity following failure at a task. Weiner (1970) reports results which suggest that the addition of this fourth variable was appropriate.

There are differences in the manner in which people approach new situations. Some are more concerned with their chances of success than they are with the possibility

of failure. In terms of the above model, they are more highly motivated by hope of success than by fear of failure. Atkinson would label this achievement motivation. On the other hand, he would see the avoidance motive as a disposition to avoid failure and to feel shame as a consequence of failure. Atkinson suggests that there is a relationship between a person's attitude toward failure and success and his behavior in risk taking situations.

MOTIVATION AND RISK-TAKING BEHAVIOR

It is based on the association presented by McClelland that Atkinson developed his model of risk-taking behavior. He sees this motivation to either achieve success or avoid failure as an integral aspect of each individual's behavior when approaching a risk-taking situation. He found that the motive to achieve is highest when the probability of success is at the 0.50 level; that is, when there is an equal chance of success or failure. On the other hand, the person motivated to avoid failure, according to Atkinson's theory, will prefer not to attempt any task. If forced to make a choice, he will avoid tasks of intermediate difficulty and will choose either those with a high probability of success where he has little chance of failure or those with a low probability of success where failure will be less a reflection on his ability than on the difficulty of

the task.

Some support for the Atkinson model is found in occupational literature. Mahone (1960) found that persons more highly motivated by fear of failure tended to choose occupations where their probability of success (based upon their own and others assessments of their ability and their interest patterns) was either extremely high or extremely low. On the other hand, those who appeared to be more highly motivated by a desire to achieve success indicated vocational choices which were in the intermediate range of success probability. A student's choice of a college major has also been investigated in terms of the Atkinson model (Wish, 1970). The choices of students more highly motivated to achieve success did not fall clearly into the intermediate range of risk. However, students motivated to avoid failure did select either very easy or very difficult majors.

Atkinson himself reports research which supports his theory (Atkinson, Litwin, 1960; Atkinson, Earle, Bastian, 1960). In the former, a group of college men was studied and it was found that persons whose motivation to achieve success is significantly stronger than their motivation to avoid failure will tend to choose tasks which are of intermediate difficulty, will be more persistent when working on achievement related tasks and will show a greater level

of accomplishment than those who are more highly motivated to avoid failure. The Atkinson, Bastian, Earle study indicated that the Atkinson model holds both in situations where skill is important and in situations which are entirely controlled by chance.

Litwin (1966) found support for the Atkinson model as well, as he reports that achievement oriented subjects choose tasks of intermediate difficulty to a significantly greater degree than do those with a failure orientation. However, the differences were not as significant when objective cues were present. DeCharms and Dave (1965) also found that when achievement oriented subjects have some indication of their probability of success, they do not tend to take moderate risks to the extent that they do when they are not aware of their probability of success.

Hancock and Teevan (1964) were interested in the application of the Atkinson model as well. However, they questioned the validity of using only college students for a sample as they felt that by this stage many people who have low need for achievement would have been eliminated from the population. For this reason, they chose to work with high school sophomores and although their findings do not support the Atkinson model in all aspects, they found that subjects whom they termed as having fear of failure showed significantly more irrational behavior than did

subjects who were considered to have higher hope of success.

Like Hancock and Teevan, DeCharm and Dave (1965) felt that it was important to consider the implications of the Atkinson model for other than a college population. It was with this in mind that they chose as their sample a group of elementary school boys from the fourth, fifth and sixth grades. Rather than using Atkinson's classification of achievement motivation which takes into account both fear of failure and hope of success, DeCharm and Dave broke this down into the two individual components. They considered groups for hope of success and fear of failure under the following headings: high-high, high-low, low-high, and low-low. The group high in fear of failure and low in hope of success stood out from the other groups in that they avoided moderate risks to a greater extent; hence, this aspect of the Atkinson model is supported. Not only does this model apply to different age levels of the middle class population used in most of the studies reported to this point, but a project carried out by Flynn (1971) provides support for the use of the constructs of achievement motivation and risk taking with disadvantaged children as well.

Canavan (1969) expressed two major concerns with Atkinson's interpretation of risk taking behavior. She

questioned the validity of using 0.5 probability as moderate risk as she feels most studies indicate it to be lower. Furthermore, she felt that it is inappropriate to use group norms when determining the amount of risk involved for an individual. In her study, she hypothesized that reward oriented subjects, or in Atkinson's terminology, those motivated by hope of success, would choose high risks, and that cost oriented individuals, or those motivated by fear of failure, would choose low risks. She also suggests that this contradicts the Atkinson interpretation of behavior in such a situation; however, it is of interest at this point to consider just what she means by high and low risk.

Canavan categorized a number of students according to their orientation either to reward or to cost, and presented them with a series of problem situations of varying degrees of difficulty. Each individual was given twenty free trials where he could choose any level of difficulty he desired. However, before attempting the free trials, he was asked to predict his chances of success at each level of difficulty based on earlier practice trials. On the most difficult level (high risk, in her estimation), the prediction of their possibility of success for all subjects, both reward and cost oriented, ranged from 6.7 to 11.2 successes out of twenty trials. The overall mean

expected score was 8.6 out of twenty trials at this level. According to the Atkinson model, this would fit well into the moderate range (i.e., between 0.3 and 0.7 probability of success) and would not be considered an extreme risk. Thus high risk according to the Atkinson model (i.e., from 0.0 to 0.3 probability of success) is not being considered. Although Canavan expresses some dissatisfaction with the Atkinson model, her results tend to support it. Differences are more concerned with definition than results.

There is considerable research supporting the Atkinson model of risk-taking behavior. That persons more highly motivated by fear of failure than by hope of success will take extreme risks is agreed upon by most research reported. Although support is not as strong for the Atkinson position that those more highly motivated by hope of success than by fear of failure will tend to take moderate risks, a number of studies would indicate that this is the case.

GENERAL TEACHER INFLUENCE

In order to have a situation where students will take profitable risks, it would seem that they should be more highly motivated by hope of success than by fear of failure. The teacher's role in the development of this attitude has been pointed out by a number of researchers.

The work of Anderson (Flanders, 1965) stresses the influence of teacher behavior on the atmosphere of the classroom and, thus, on the behavior of the individual student. He found that:

> The behavior of the teacher, more than any other individual, sets the climate of the class.... It is the teacher's tendency that spreads among pupils and is continued even when the teacher is no longer in the room. Furthermore, the pattern a teacher develops in one year is likely to persist in his classroom the following year with different pupils. (p. 4)

He goes on to point out that different kinds of teacher behavior produce different types of behavior on the part of the student.

Canavan (1969) reports that an individual trained by someone who ignores his failures and praises his successes will develop greater confidence in his ability and will have greater expectations of what he can accomplish for himself. He will be willing to try different tasks; he will perform well and obtain good outcomes. He will tend to approach tasks with maximum risk at which he can be successful, thus avoiding extremely low risk taking situations. This gives support for the proposal that a positive attitude towards himself and his ability is highly correlated with a student's achievement and his performance in risk-taking situations.

Bledsoe (1967) reports a low positive correlation

between self-esteem and academic performance even when measured IQ is controlled. Gibby and Gibby (1967) report that failure has a negative effect upon cognitive functioning. This is understandable and supports Barret's (1957) results which he interprets as indicating that feelings of inadequacy among bright underachievers act as depressors which cause them to withdraw and refuse to compete. Not only is there a relationship between self-esteem and academic achievement, but Bieri and Trieshman (1956) suggest that the self-concept may influence certain aspects of social learning.

Veroff and Peele (1969), in studying the effects of desegregation on the achievement motivation of Negro elementary school children, found that differences did appear when environments were changed. They found, for example, that Negro boys who were transferred into a white school had significantly higher motivation scores than Negro boys who were not transferred. This suggests that the school environment can have an influence on the development of achievement motivation in students. Hunt and Hardt (1969) studied the effects of a precollege enrichment program for high school students from low income families. Significant increases were reported on measures of attitude and motivation on the part of those participating in the study. This increase could not solely be attributed to the

program as increases are also related to age. However, a significant increase in self-esteem, which does not appear to increase with age for culturally disadvantaged high school students, was observed. Thus, it is feasible that both self-esteem and achievement motivation can be increased by specific programs.

If the teacher does have an influence on the student's attitude towards success and failure in new situations, in terms of Atkinson's model, she can affect his risk-taking behavior. Attempts have been made to identify various teacher behaviors and show that they are correlated with certain attitudes or actions of the student.

SPECIFIC TEACHER CHARACTERISTICS

Gage (1965) has identified a number of characteristics in teachers which are high correlated with desirable outcomes in student behavior. High among those mentioned was warmth which he considers to be approving, supportive, sympathetic, accepting teacher behavior.

Read (1961) found that warmth on the part of the teacher was highly correlated with student interest in a particular subject area. He reported that "science interests of many pupils in this sample are independent of the low and moderate demands of the teacher, but are a function of

the teacher's capacity to establish a relaxed, interpersonal relationship with the pupil, and of the teacher's ability to utilize the educational principle of intrinsic motivation (p. 228)." It is the former characteristic which is of interest here, and which corresponds with the findings of Medley and Mitzel (1959) who consider emotional climate. Although they did not find significant differences in academic achievement, classes which had high instance of warmth and friendliness were considered by raters to be most effective. Teachers considered low on this dimension frequently used sarcasm, reproving remarks, frowns, glares and ignoring behavior.

Shrago (1970) in investigating the effect of approving teacher comments on pupils' attitudes and achievements found no significant relationship; however, he attributed this to problems of methodology and the setting used. On the other hand, Ladd (1972) found that being generous and kind tends to increase one's power over those who receive this favor. Ladd supports the model of Bandura and Walters (1963) and Bandura (1971), when he reports that teachers can manipulate rewards and, thus, behavior in a variety of ways - being attractive, cheerful, polite, having students do what they like doing and perhaps most important, accentuating the positive rather than the negative. He also emphasizes the importance of praising

behavior.

Ryan (1961) also reports that in elementary school classes, high positive relationships were found between productive pupil behavior and teacher behavior involving understanding, friendly classroom behavior and, organized, stimulating, original classroom behavior. Again some similarity is evident between this type of teacher behavior and what will be referred to in this study as positive, facilitative behavior. The productive pupil behavior referred to includes such descriptive terms as confidence, responsibility, participation, self-control and initiating behavior, all of which could be associated with moderate, productive risk taking.

Both Cogan (1958) and Amidon (1961) developed scales for investigating classroom behavior and in both cases, a similarity to the positive - negative dichotomy being considered here is evident. The former deals with Inclusive and Preclusive behavior; Inclusive behavior includes that which is integrative, affiliative and nurturant whereas Preclusive behavior is dominant, aggressive and rejectant. He was concerned with independence and productivity on the part of the student; he anticipated a negative relationship between Preclusive teacher behavior and both of those factors and found some support for his hypothesis.

Amidon (1961) speaks of teacher initiated talk and

responses in terms of accepting and rejecting reactions. The accepting teacher deals with ideas by reflecting, clarifying, encouraging and praising ideas of pupils. She commends and encourages pupil behavior and encourages them to express feelings. All of this will develop within the student confidence in his ability. On the other hand, the rejecting teacher criticizes, ignores and discourages pupil ideas and behaviors and ignores or rejects the pupil's expression of his feelings.

Flanders (1965) developed a scale which is similar to the positive - negative classification considered here. He rates teacher behavior on what he calls a direct - indirect scale. The former refers to statements made which restrict action on the part of the student and which are based, to a great extent on teacher authority. On the other hand, the indirect approach uses statements which increase the students freedom, encourage participation and initiative behavior. It involves asking questions, accepting and clarifying the student's ideas and feelings and praising or encouraging the student's responses. He found that "the indirect teacher approach encourages students to develop more responsibility for diagnosing their difficulties and for suggesting a plan of action...whereas a direct approach conditions the students to seek the teacher's help and to check with the teacher more often to be sure they are on

the right track (p. 116)."

Bellack, Kliebard, Hyman and Smith (1966) categorize teacher reaction to student responses on a scale from negative through not admitting, qualifying, repeating, admitting to positive. Steines (1958) used a positive - negative continuum to evaluate teacher behavior. If this were to be applied to the Bellack, Kliebard, Hyman and Smith evaluation of teacher reaction, it would enable us to compare teacher behavior in terms of their reaction to student responses.

Bondi (1971) recognizes the importance of analyzing and categorizing the verbal behavioral patterns of teachers and supports the use of the Flanders' system of interaction analysis. He points out a variety of teacher talk patterns and their effect upon pupil learning. Roush and Kennedy (1971) used the same approach in analyzing verbal behavioral patterns and after a three week training period, reported significant differences between the verbal patterns of teachers in a control and an experimental group.

This can have important implications for development of educational programs as it suggests that teacher behavior can be changed. Lang (1971) supports this as well, as he found that a single twenty minute exposure of student teachers to a model who exhibited specific behaviors produced a significant amount of that behavior in those who

observed it. This procedure was successful in producing more indirect verbal behavior, or in terms of the model used here, more positive behavior in student teachers.

SUMMARY

It is generally supported by the literature that the teacher can influence student learning patterns by the manner in which she conducts classroom activities. More specifically, the teacher can develop within students a positive attitude towards themselves and their chances of success in new situations. A number of studies verify Atkinson's theory which states that such a positive attitude towards chances of success is associated with moderate risk-taking behavior on the part of the student, whereas a disposition towards failure is associated with extreme risk-taking behavior. Not only is the student's learning affected by the teacher's behavior, but teacher behavior can be changed by such methods as Interaction Analysis so that each teacher can have the most beneficial effect on the student's learning patterns.

CHAPTER IV

PROCEDURE

CHOICE OF CLASSES

It is believed that the attitude towards achievement, one of the factors which may influence risk taking, is fully developed somewhere between the age of five and nine (McLelland, 1953). It has also been suggested that risk taking is in a purer state at this stage as a child has not yet learned which are the proper risks to take. For these reasons, the sample for this study was selected from eighteen Grade Three and Four classes in schools near Edmonton. Students in those grades should be reaching the end of the developmental period mentioned by McLelland. Groups where more than one teacher is involved in instruction have been omitted except in cases where this involves less than twenty percent of the class time.

After the classes had been chosen, each teacher was approached individually; she was asked to participate in a study of the relationship between classroom interaction and risk taking behavior in children. At this point, all teachers were given the opportunity to drop out; three asked to be eliminated, cutting the number of classes to fifteen, and later, one more class had to be eliminated because of technical difficulties, leaving fourteen classes

participating.

Three five minute segments of a thirty minute social studies or science class were recorded. This was carried out either by the teacher in the classroom or through the school public address system. In cases where the recorder was in the class, the teacher was asked to tape a variety of activities during the day so that by the time the class to be rated was being taped, the students would not be inhibited by the presence of the recorder.

The dialogue on each of the tapes was transcribed and it was on this basis that the class was rated.

The analysis of the classroom interaction was carried out by three independent raters who were trained on the use of the scale on a class transcript provided for that purpose. One rater was a full time elementary school teacher, another a secretary with exprience as an adult education teacher and the third the experimenter. Considerable time was spent making the raters familiar with the nature and goals of the study and the rationale behind the rating scale. An inter-rater reliability analysis reported a high positive correlation between the three raters (Appendix E).

RATING SCALE

The manner in which a teacher reacts to information offered by the student may have an influence on the way in which he views himself and his abilities. It was with this in mind that this study, in rating teachers, considered only their reaction to student responses. As all classes were carried out in the form of a teacher-led discussion, this accounted for most teacher statements. It also allowed the use of one aspect of Bellack's approach to analyzing the language of the classroom; this deals specifically with teacher reaction to student responses. This scale was modified to include a neutral category, and responses were arranged on a continuum from negative to positive similar to that developed by Staines (1958), so that a total positive-negative scale could be obtained on each teacher (Appendix A).

Five categories were developed. Negative responses (scored as 1) included such comments as "No", "Wrong", "That's a terrible answer". Slightly negative responses (scored as 2) included statements which refused to admit correctness by stating the direct contrary, or indicating some mild reservation. The neutral category (scored as 3) included ignoring, interrupting and ambiguous reactions. Slightly positive responses (scored as 4) included such

comments as "Uh-huh", "All right", "O.K." and other mild positive statements. Positive responses (scored as 5) involved statements such as "Yes", "That's right", "Certainly", "A good answer" and "Exactly".

After all responses had been rated, the scores were combined and an average positive - negative score was obtained for each teacher.

SAMPLE

Based on the positive - negative scores obtained on the above rating scale, the classes of the three most positive and the three least positive teachers were chosen for further study. Two classes in each group were at the Grade Four level and one at the Grade Three level. Stuck (1971) reported no significant differences in the verbal interaction of groups with differing ability. He worked with average and special classes at the primary and intermediate level and used the Flanders system of interaction analysis to investigate classroom interaction. With this in mind, it was considered unnecessary to match classes for ability.

SELECTION OF STUDENTS

The teacher of each class chosen to participate in this aspect of the study was asked to choose the three boys

whom she felt were gaining most from the experience of being in her class that year. Thus, eighteen boys were involved in the study. Each teacher was allowed to choose her students on the basis of her own evaluation of what a successful student is. Thelen (1967) reports that there are differences in teachers' attitudes towards teachability of students. He goes on to suggest that students' progress is influenced by the attitudes which their teachers hold.

It was decided to carry out this study with boys only as the research indicates that there are differences in the ways in which males and females react to risk-taking situations (Flynn, 1971). Kogan and Wallach (1959) found that males exhibited more confidence in their judgements than did females. Males were more extreme in their judgements in low and moderate confidence areas whereas females were more extreme in high confidence areas. It is also of interest to note that almost all studies reported in this area, especially when young children are involved, use male subjects.

It is felt that by choosing students who are successful in the class, one would be working with those who will have the best opportunity to have a good attitude towards themselves and their abilities. If differences can be found between the two groups here, they should be even greater in the general population. Also sutdents who are

successful in a class where the teacher is more positive will probably develop different skills and attitudes than the student in the class where the teacher is less positive.

RISK-TAKING TASKS

NON-ACADEMIC TASK

The non-academic risk-taking task involved throwing a volley ball into a two foot square box from varying distances. It was based on the procedure established by DeCharme and Dave (1965). Trials were carried out with ten Grade Three and Grade Four students and distances were set up at 3, 6, 9, 12, 15, 18 and 21 feet.

This task was administered on an individual basis. The subjects were required to get the ball into the box without first touching the floor. If the ball bounced out of the box after going in, it was scored as a hit.

The procedure began with seven warm-up shots - one from each of the seven distances. This was followed by a series of seventy practice shots - ten from each distance. Following the practice session, the subject's probability of success at each position was computed and based on this, incentive points were determined. The points ranged from one to ten, depending on the probability of success; if the subject had 100% probability of success, he received

one point; if he had 10% or 0% probability of success, he would receive ten points. At each distance, the subject's probability of success and the incentive points he might earn were placed on a card.

Next, the subject was given twenty free trials on which he could stand at any one or a variety of the seven positions. His objective was to accumulate as many points as he could. His moderate risk-taking score was based upon his choice of position on those twenty free trials.

ACADEMIC TASK

The academic task was set up in a similar manner to the non-academic task. The volley ball shooting procedure was replaced by a series of mathematics problems of varying difficulty.

As in the previous situation, the risk taking procedure was preceded by a session which established the subject's probability of success at each level. The student was presented with five series of seven problems of increasing difficulty (Appendix B). Both this set of problems and those used later to measure risk-taking behavior were first administered to a group of thirty-one students to determine that the problems were of appropriate difficulty for this age level (Appendix D). The student's probability of success at each of the seven levels of

difficulty was established and incentive points based on this probability were given. If the student had 100% probability of success, he received one point; 20% probability would mean five points and 0% probability would give the student six points.

After the student was informed of his probability of success and the incentive points he could earn, this information was placed on the sheet of problems that was used to determine risk-taking behavior. This test consisted of a series of twelve rows of seven problems of similar difficulty to those used to determine success probability and incentive points (Appendix C). The student was asked to choose one problem from each row and complete it. As he answered each problem, he was told whether or not his answer was correct. This approach was taken so that the procedures followed in the academic and non-academic situations could be as similar as possible.

The student's moderate risk taking score was based on the final seven choices he made. The first five problems, which had not been tested for similarity with the previous set of problems, were used to allow a pattern of behavior to develop. In administering the last seven problems to a group of students prior to using it in the actual study, it was observed that the student's first responses tended to be random in nature. Hence, the above

procedure was instituted to offset the possibility of unrealistic scores based on the student's adjusting to the new situation.

CHAPTER V

RESULTS AND INTERPRETATIONS

CHOICE OF CLASSES

The classes used to investigate risk taking behavior were chosen on the basis of the teacher's reaction to student responses. Individual responses were rated on a five point scale ranging from negative (1) through neutral (3) to positive (5). The rating was carried out by three independent raters and their reliability is reported in Appendix D. An average positive-negative score for each teacher was computed on the basis of the results (Table I).

The three classes where the teacher reaction was most positive and the three classes where the teacher reaction was least positive were selected for further analysis. The possible scores ranged from one (negative) to five (positive) with neutral and less extreme categories between. All scores ranged from 2.99 to 3.65, that is, from neutral to slightly positive; hence, the classification to be used from this point on will be "positive reaction" for the three highest scorers and "less positive reaction" for the three lowest scorers. If a difference in student risk-taking behavior can be found in this situation where there is less than one point difference between the highest and lowest

TABLE I

TEACHER-REACTION SCORES

Teacher	Score
1	3.49
2	3.19
3	2.99
4	3.40
5	3.07
6	3.14
7	3.33
8	3.17
9	3.25
10	3.34
11	3.07
12	3.65
13	3.60
14	3.32

teacher reaction score, the disparity in risk taking scores should be even greater if the difference in teacher reaction were greater (i.e., a low score of 1.5 and a high score of 4.0).

After the classes had been chosen, the teachers were asked to choose the three most successful boys from their class. An academic and a non-academic task were administered to each boy on an individual basis.

NON-ACADEMIC TASK

The non-academic task involved throwing a volley ball into a box from seven distances of increasing difficulty. The average probability of success at each of the seven distances was calculated (Table II). Based on the

TABLE II

NON-ACADEMIC TASK: CHANCES OF SUCCESS

(OUT OF TEN TRIALS)

Position	1	2	3	4	5	6	7
Grade III	9.7	6.2	3.2	3.8	1.5	0.8	0.3
Grade IV	9.4	8.4	5.7	3.1	2.4	0.5	0.6
TOTAL	9.5	7.1	4.8	3.3	2.1	0.6	0.5

above results, positions three and four were designated as the moderate risk area. Each individual's moderate risk-taking score was based on the ratio of his number of moderate

choices to his total possible choices (Table III).

TABLE III

MODERATE RISK-TAKING SCORE (NON-ACADEMIC TASK)

Positive Teacher Reaction		Less Positive Teacher Reaction	
Student	Score	Student	Score
1	0.70	1	0.35
2	0.85	2	0.90
3	1.00	3	0.40
4	0.93	4	0.30
5	0.30	5	0.30
6	0.65	6	0.40
7	0.45	7	0.15
8	0.90	8	0.15
9	0.65	9	0.55
TOTAL	6.45	TOTAL	3.50
AVERAGE SCORE	0.72	AVERAGE SCORE	0.38

Source	MS	df	t	p
Groups	0.34	16	3.4	0.01
Error	0.01			

Those results support the hypothesis that, in risk-taking situations, a difference is found in the performance of students from a class where teacher reaction is positive and the students from a class where teacher reaction is less positive. In the case of the students with the positive teacher, there is a tendency to choose moderate risk situations. On the other hand, students from the class with the less positive teacher tend to choose fewer moderate risks.

ACADEMIC TASK

The academic task was made up of a series of mathematics problems of increasing difficulty. They ranged from one (very easy) to seven (very difficult). Because of the wide range of students' ability in mathematics, it was decided to analyze the results of the academic task in two ways. First, an approach similar to that used in the non-academic situation was employed. The average probability of success at each of the seven levels was determined (Table IV). Positions two and three were designated as the moderate risk areas and the moderate risk score was again based on the ratio of the number of responses in the moderate range to the total number of responses. Table V shows the moderate risk taking scores which were obtained.

TABLE IV

ACADEMIC TASK: CHANCES OF SUCCESS

(OUT OF TEN TRIALS)

Position	1	2	3	4	5	6	7
Grade III	8.7	5.6	4.0	1.8	1.4	0.0	0.4
Grade IV	9.7	7.1	6.0	3.8	1.8	0.0	0.2
TOTAL	9.2	6.3	5.1	2.8	1.6	0.0	0.2

As predicted, the difference between the two groups is not significant suggesting that, in academic situations, risk-taking behavior of students may not differ whether teacher reaction is positive or negative. However, a trend does appear in the direction of higher scores for the group with the positive teacher reaction.

The differences in the ability of the subjects made it appropriate also to look at moderate risk taking in terms of individual as well as group probability of success. In approaching the problem from this point of view, it was decided that if a subject had two or three problems correct out of a total of five, this would constitute moderate risk in those columns. If he had zero or one problems correct, it was an extremely high risk, and four or five correct

TABLE V

MODERATE RISK-TAKING SCORES (ACADEMIC TASK)

TREATMENT I

Positive Teacher Reaction		Less Positive Teacher Reaction	
Student	Score	Student	Score
1	0.00	1	0.14
2	0.00	2	0.43
3	0.57	3	0.00
4	0.43	4	0.00
5	0.00	5	0.00
6	0.00	6	0.00
7	0.29	7	0.43
8	0.00	8	0.14
9	0.57	9	0.57
TOTAL	1.86	TOTAL	1.71
AVERAGE SCORE	0.21	AVERAGE SCORE	0.19

Source	MS	df	t	p
Groups	0.02	16	0.18	N.S.
Error	0.11			

would indicate extremely low risk. Using this approach, two subjects had to be eliminated as one had only one correct in the first column and none in each of the others, and another had five correct in the first column and none correct following this. Thus, for them, any choice would constitute extreme risk. It is of interest to note that both students were from a class where teacher reaction was positive and, in both cases on free trials, they made all choices in the first column where they had the best chance of success.

The moderate risk scores obtained using individual rather than group moderate range appear in Table VI.

Here again, there is no significant difference between scores suggesting that there is no difference in risk-taking behavior between students in a class where teacher reaction is negative and students in a class where teacher reaction is positive. In this case, however, the trend which does appear is in the direction of the group with the negative teacher. This may be the result of some difficulties with the testing instrument which will be discussed more fully in Chapter VI.

TABLE VI

MODERATE RISK-TAKING SCORES (ACADEMIC TASK)

TREATMENT II

Positive Teacher Reaction		Less Positive Teacher Reaction	
Student	Score	Student	Score
1	1.00	1	0.86
2	1.00	2	0.43
3	0.86	3	1.00
4	0.43	4	0.00
5	0.00	5	0.86
6	0.29	6	1.00
7	0.14	7	0.43
		8	0.00
		9	0.59
TOTAL	3.72	TOTAL	5.17
AVERAGE SCORE	0.53	AVERAGE SCORE	0.57

Source	MS	df	t	p
Groups	0.04	16	0.2	N.S.
Error	0.20			

CHAPTER VI

SUMMARY, DISCUSSION AND IMPLICATIONS

The fundamental aim of this study was to show that there is a relationship between the way in which a teacher reacts to a student's responses and the student's behavior in risk-taking situations. More specifically, it was hypothesized that on a non-academic task, successful boys in a class where the teacher reacts in a positive manner would tend to take more moderate risks than would the boys from a class where the teacher reacts in a less positive way. On the other hand, when the task is academic in nautre, the risk-taking performance of the boys with the positive teacher reaction and the boys with the negative teacher reaction will not be significantly different.

The non-academic task used to measure risk-taking behavior involved throwing a volley ball into a box from distances of increasing difficulty. The results of this procedure tend to support the hypothesis that there is a difference in the risk-taking performance of children from a class where teacher reaction is positive and children from a class where teacher reaction is less positive. The students in the former situation took significantly more moderate risks than did those in the latter situation.

This tends to support the suggestion made in Chapter I that learned behavior patterns will transfer to new and different situations more readily in the case of a student with a teacher who reacts in a positive way than in the case of a student with a teacher who reacts in a negative way.

For the purpose of looking at risk-taking behavior on an academic task, a scale composed of mathematics problems was developed specifically for this study (Appendices B and C). The results obtained from this instrument tended to support the hypothesis that on an academic task, there should be no significant difference between the risk-taking behavior on the part of students in the class of a positive teacher and the students in the class of a negative teacher. Considerable variation in ability was observed on this task. This variation was not entirely related to grade level as the highest scorer was from a Grade Three class. The varying ability of the students made it seem appropriate to use individual rather than group moderate risk range. Because of the change, it was felt that a broader choice of proability levels would result in more valid results. The present instrument used only five problems at each of the seven levels of difficulty to determine probability of success. When individual rather than group probability of success is being used to determine moderate risk-taking

scores, the probability scores are limited to zero, one, two, three, four and five successes out of five trials. When zero, one, four and five are eliminated as extreme risk scores, only two and three successes out of five trials remain to be considered as moderate risk. Consider the case of the student who receives the following probability scores on the seven positions: five, four, three, one, one, zero and zero. Using the above procedure, the third position only would be considered as moderate risk. If half of his free trials were from the second position, his moderate risk-taking score might be considered unrealistically low. If ten rather than five trials at each of the seven positions were used to determine probability of success, this problem could be decreased considerably as a larger number of probability scores could be designated as moderate risk. With eleven rather than six possible scores to choose from, five rather than two could be considered moderate risk.

It will be remembered that each of the teachers taking part in this study was aware that her class was being taped. One might question whether the results obtained using such a method would give an accurate picture of the everyday classroom situation. The teachers were not aware of the particular aspect of classroom interaction

which was being observed. Thus, the improved impression which they might attempt to give would be very general in nature and both positive and negative teachers might be inclined to make such an impression. The results, in any case, indicate that there was a difference in the teachers' reactions to students' responses. This difference might have been even more obvious had the teachers not been aware that they were being taped.

The results of this study tend to support the Atkinson model of risk taking; however, there are some areas that merit further investigation. As was the case in Canavan's (1969) research, the question of using the group mean to judge probability of success was raised. It appeared to be more appropriate, particularly when ability levels varied, to use individual probability scores. Atkinson's designation of the moderate risk range is somewhat arbitrary and was questioned by Canavan (1969) as well. Further work could be carried out to clarify the issue of what a moderate risk actually is.

If, as the results of this study suggest, teachers can influence student behavior by the manner in which they react to the student's responses, teacher training programs could emphasize appropriate teacher behavior during discussions and question periods. Johns (1968) found that

when teachers used an indirect questioning technique, that is, an approach similar to the positive one considered in this study, there was a greater incidence of thought-provoking questions and behaviors on the part of students. It would appear that they were more willing to take risks in classroom discussion.

The results of this study may have implications not only for activities in the classroom, but for general child rearing practices as well. If the teacher's reaction to a child's idea has an effect on his behavior, is it not also possible that a similar interaction will take place between parents and their children? Similarily, in all human relationships, an individual's willingness to take risks may be influenced by the reaction of others to his ideas.

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APPENDICES

APPENDIX A

RATING SCALE FOR TEACHER REACTION

Directions to Raters:

The five categories which you are to use in rating teacher reaction are listed below with appropriate examples. Find the category which most accurately labels the statement you are considering and assign the number of points listed in the left hand column.

Points	Category	Description	Example
1.	Negative	An explicitly negative statement.	No. Wrong. That's a terrible answer. Nope. Uh-uh.
2.	Slightly Negative	Any indication of reservation, however mild or oblique.	Yes, but.... However,.... Nevertheless.... That's one way of saying it.
		Making no explicitly negative statement, but refusing to admit by stating the direct contrary. Inciated by restating a positive utterance in negative terms or a negative utterance in positive terms.	England is <u>not</u> in the Common Market. We <u>do</u> have bauxite resources.

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[1]This scale is based on that presented by Ballack in <u>The Language of the Classroom</u> (p. 32). Aspects of Ballack's scale were placed on a continuum and a neutral category was added.

3.	Neutral	Ignoring responses. Interrupting students. Student response followed only by another unrelated question. Seemingly positive statements which merely mean "Let's go on." Any ambiguous statement.	O.K. All right.
4.	Slightly Positive	A mild or equivocally positive statement	All right. O.K. Uh-huh.
		An implicit admitting by a sample repetition, rephrasing, or restatement.	Land, labor and capital.
5.	Positive	An explicitly positive statement.	Yes. Right. Correct. A good answer. Exactly. Precisely.

APPENDIX B

ACADEMIC TASK USED TO DETERMINE PROBABILITY

	1	2	3	4	5	6	7
1.	76 + 23 =	258 + 98 =	2867 + 896 =	98 + 179 + 86 =	1/3 + 2/3 =	1/5 + 1/10 =	1/5 + 1/4 =
2.	61 + 35 =	369 + 87 =	7612 + 999 =	89 + 197 + 78 =	1/6 + 2/6 =	1/3 + 1/6 =	1/6 + 1/4 =
3.	14 - 8 =	87 - 18 =	678 - 99 =	42 - 18 - 9 =	7/9 - 2/9 =	7/10 - 2/5 =	3/4 - 1/3 =
4.	17 - 9 =	96 - 17 =	769 - 88 =	68 - 32 - 19 =	7/8 - 3/8 =	3/4 - 1/2 =	3/5 - 1/4 =
5.	8 x 7 =	243 x 3 =	38 x 9 =	5 x 4 x 20 =	1/4 x 3 =	2/9 x 3/4 =	7/9 x 1-2/3 =

APPENDIX C

ACADEMIC RISK-TAKING TASK

	1	2	3	4	5	6	7
1.	51 + 26 =	361 + 899 =	3666 + 789 =	129 + 63 + 38 =	1/8 + 6/8 =	1/7 + 1/4 =	3/4 + 2/5 =
2.	74 + 44 =	294 + 898 =	7692 + 989 =	49 + 128 + 37 =	1/5 + 2/5 =	1/8 + 1/4 =	4/5 + 1/8 =
3.	15 - 8 =	47 - 8 =	432 - 38 =	42 - 19 - 6 =	7/8 - 3/8 =	3/8 - 1/4 =	1/3 - 1/4 =
4.	13 - 7 =	76 - 9 =	263 - 49 =	79 - 34 - 15 =	5/8 - 3/7 =	1/2 - 1/6 =	2/7 - 1/6 =
5.	7 x 6 =	273 x 3 =	98 x 9 =	3 x 6 x 40 =	1/3 x 2 =	2/7 x 3/4 =	6/7 x 1-1/4 =
6.	62 + 25 =	472 + 999 =	3755 + 987 =	138 + 72 + 29 =	1/7 + 5/7 =	1/4 + 1/8 =	2/3 + 1/4 =
7.	85 + 33 =	383 + 989 =	3503 + 898 =	39 + 171 + 38 =	1/4 + 3/4 =	1/2 + 1/8 =	1/5 + 1/8 =
8.	16 - 7 =	56 - 9 =	342 - 29 =	51 - 17 - 8 =	5/7 - 1/7 =	7/8 - 3/4 =	1/2 - 1/3 =
9.	14 - 6 =	65 - 8 =	431 - 39 =	59 - 41 - 17 =	3/4 - 1/4 =	5/6 - 2/3 =	2/3 - 1/4 =
10.	9 x 7 =	13 x 4 =	47 x 9 =	5 x 3 x 30 =	1/5 x 5 =	2/3 x 3/4 =	6/10 x 1-2/5 =
11.	8 x 9 =	142 x 5 =	29 x 7 =	7 x 4 x 20 =	1/2 x 2 =	2/5 x 4/5 =	6/7 x 1-2/5 =
12.	7 x 4 =	252 x 4 =	39 x 8 =	6 x 3 x 20 =	1/3 x 3 =	2/7 x 2/5 =	3/8 x 1-4/5 =

APPENDIX D

SCALOGRAM ANALYSIS OF THE ACADEMIC MEASURE

Scalogram analysis (Edwards, 1957, pp. 184 - 188) was used to determine whether the questions in each of the series of academic problems become increasingly more difficult. It was found that this was the case with accuracy ranging from 0.85 to 0.93 per cent which is considered to be high (Edwards, 1957).

SCALOGRAM ANALYSIS RESULTS ON TEST A AND TEST B

	PROBLEM	COEFFICIENT OF REPRODUCIBILITY
TEST A	1	0.92
	2	0.92
	3	0.91
	4	0.88
	5	0.92
TEST B	1	0.85
	2	0.85
	3	0.93
	4	0.85
	5	0.88
	6	0.90
	7	0.91

APPENDIX E

INTER-RATER RELIABILITY SCORES

SUBJECT	RATER A	RATER B	RATER C
1	3.47	3.54	3.46
2	3.13	3.17	3.28
3	3.07	2.91	2.98
4	3.47	3.41	3.32
5	3.10	3.11	3.00
6	3.15	3.15	3.12
7	3.24	3.36	3.38
8	3.17	3.15	3.18
9	3.22	3.24	3.30
10	3.37	3.34	3.31
11	3.05	3.09	3.08
12	3.63	3.63	3.68
13	3.64	3.54	3.61
14	3.25	3.38	3.32

Between A and B: $r = 0.92$

Between A and C: $r = 0.92$

Between B and C: $r = 0.98$